



G R A N D C O U N T Y

# LEARNING BY DOING

## LBD 2023 ANNUAL OPERATIONS PLAN

June 1, 2023

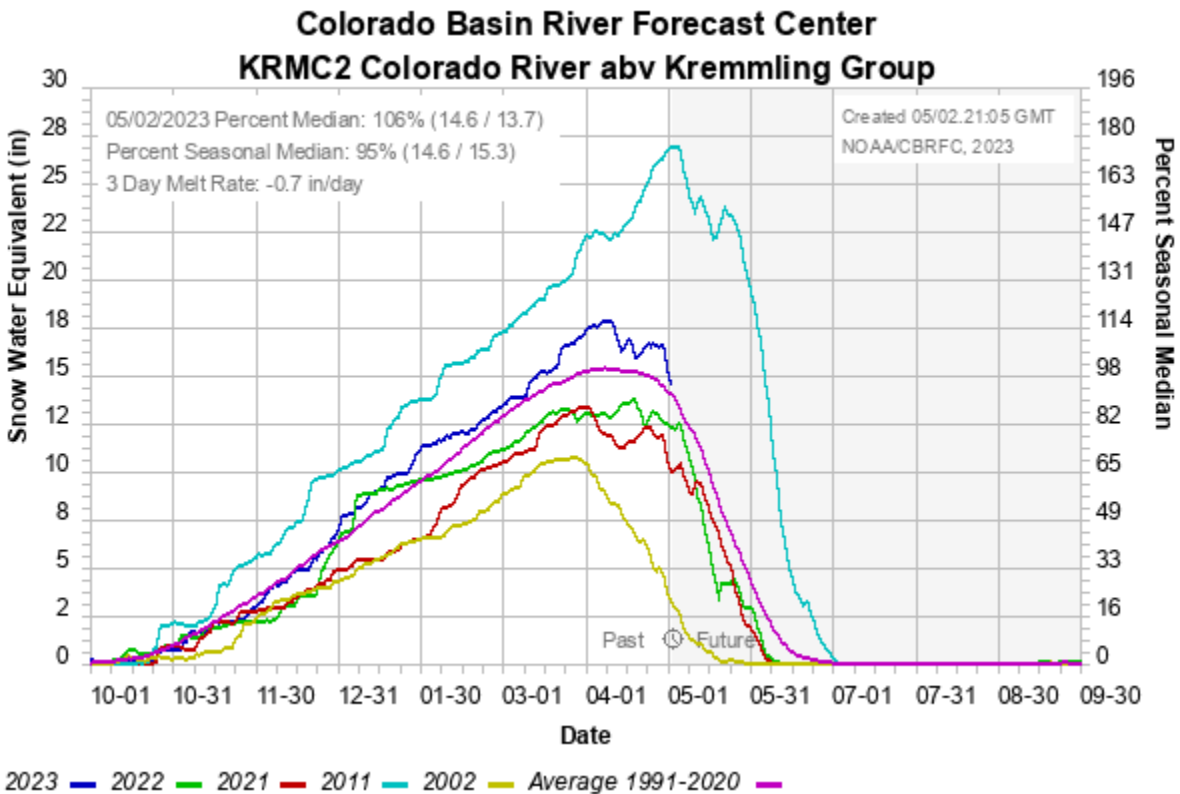
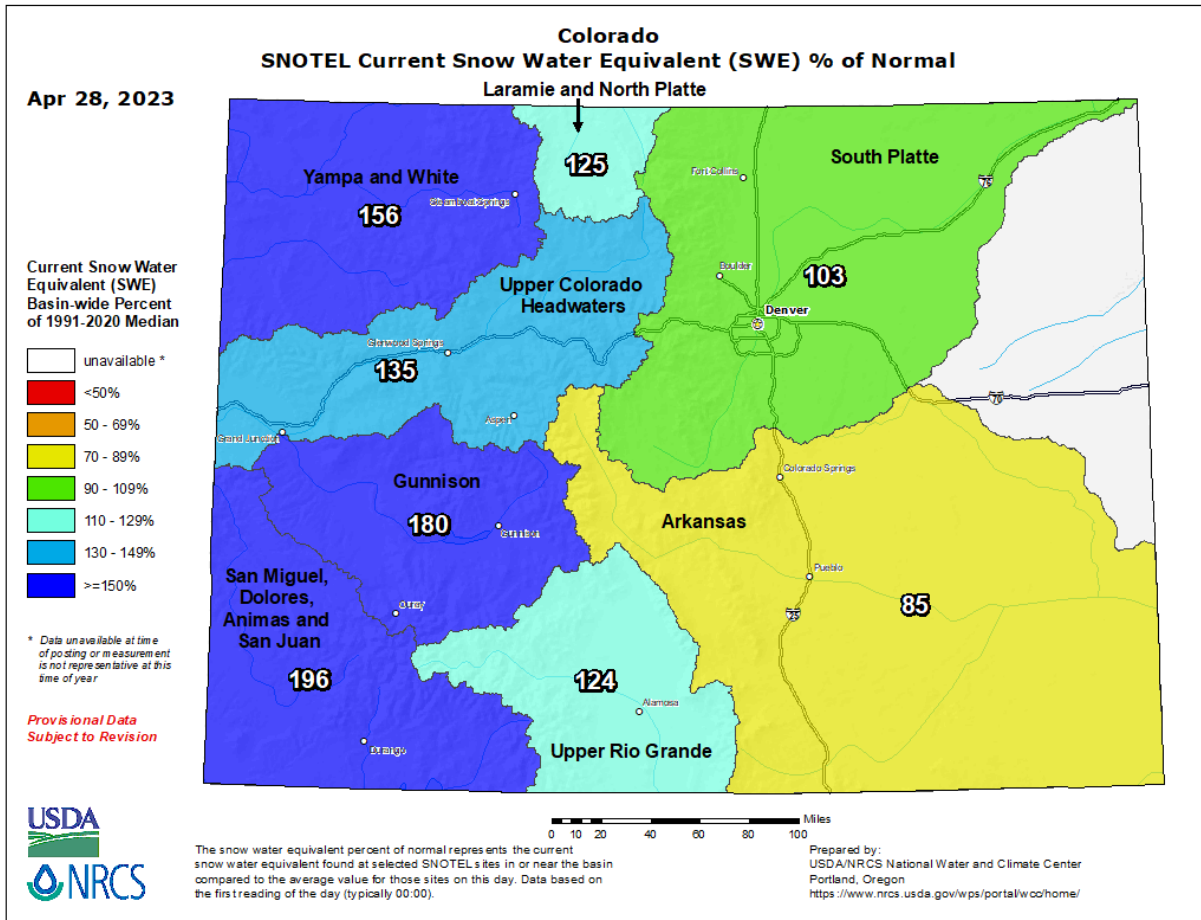
### Introduction

The Learning By Doing Cooperative Effort (LBD) is a partnership of East and West Slope stakeholders that emerged from the Colorado River Cooperative Agreement (CRCA) and Windy Gap Firing Project (WGFP) IGA. The goal of this partnership is to maintain, and where reasonably possible, restore and enhance conditions of the aquatic environment in the Colorado, Fraser, and Williams Fork River basins in Grand County (Cooperative Effort Area). The LBD Operations Plan Guidelines specify that an Annual Operations Plan (AOP) be developed to maximize the stream environmental benefits using resources available to LBD within the Cooperative Effort Area (Appendix A) and prescribes operating procedures and timelines for LBD activities in support of operations (Appendix B). The primary focus will be on streams and rivers located within the Fraser and Upper Colorado River watersheds and impacted by trans-mountain diversion (TMD) projects.

The 2023 Annual Operations Plan draws on the AOP Guidelines, guiding documents including the CRCA, the Grand County Stream Management Plan (GCSMP), hydrologic and water supply forecasts, water supply system conditions, past LBD efforts, and monitoring results to outline expected opportunities for operations consistent with the LBD Cooperative Effort.

### 2023 Snowpack and Water Supply Forecasts

Below is an NRCS map, updated April 28 2023, depicting Snow Water Equivalent (SWE) for major basins and SNOTEL sites in Colorado. Snowpack in the Colorado River basin is 135 percent of average and in the South Platte River basin 103 percent of average. Snowpack above Kremmling is 106 percent of average SWE level for this date, well below the basinwide average, see Kremmling Group Snow Water Equivalent (SWE) time series plot below. The Colorado Basin River Forecast Center (CBRFC) May 1, 2023 Official Most Probable runoff forecast at Kremming is 104 percent of average (928 thousand acre-feet or kaf, average 870 kaf, see graph below). The highest May 1 runoff forecast in Grand County is in the Willow Creek basin at 145 percent of average, and the lowest forecast is in the Williams Fork River basins at 91 percent of average. The 3 month climate outlook for Grand County is 33 percent chance for higher than average temperatures and equal chances for higher or lower than average precipitation, see Climate Prediction Center maps below.

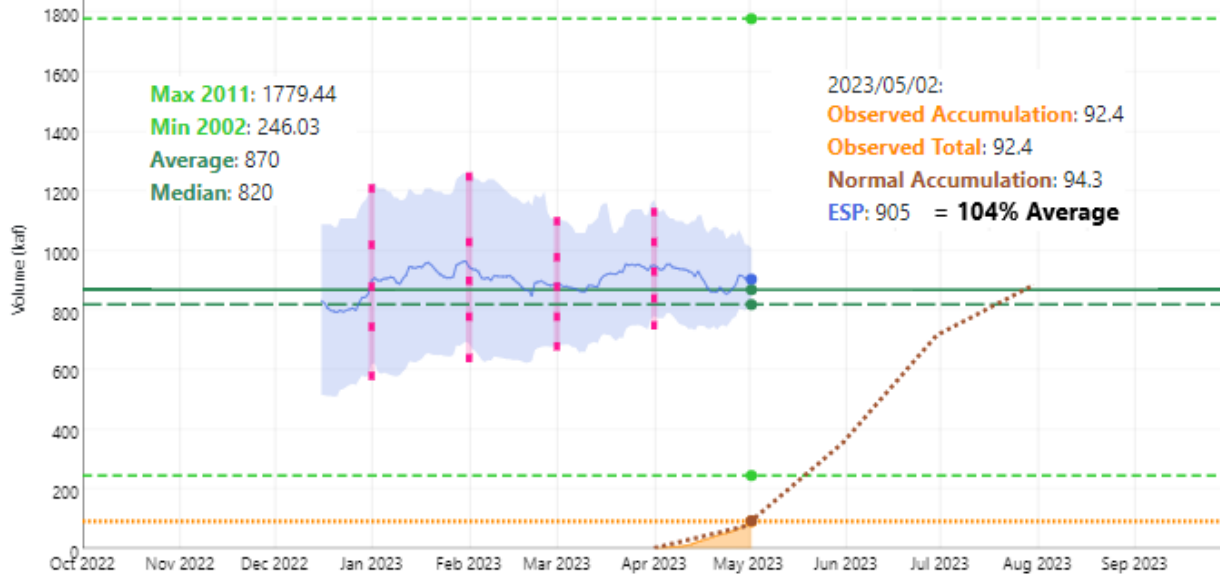


## Water Supply Forecast

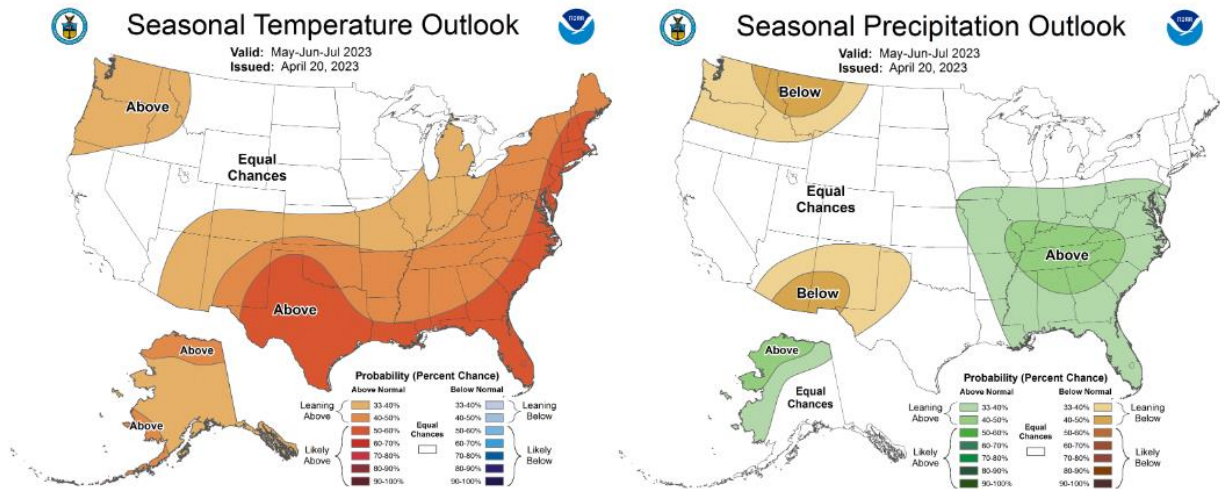
Colorado - Kremming, Nr (KRM2)

Period: Apr-Jul, Official 50% Forecast (2023-04-01): 930 kaf (107% Average, 113% Median)

ESP is Unregulated and No Precipitation Forecast Included

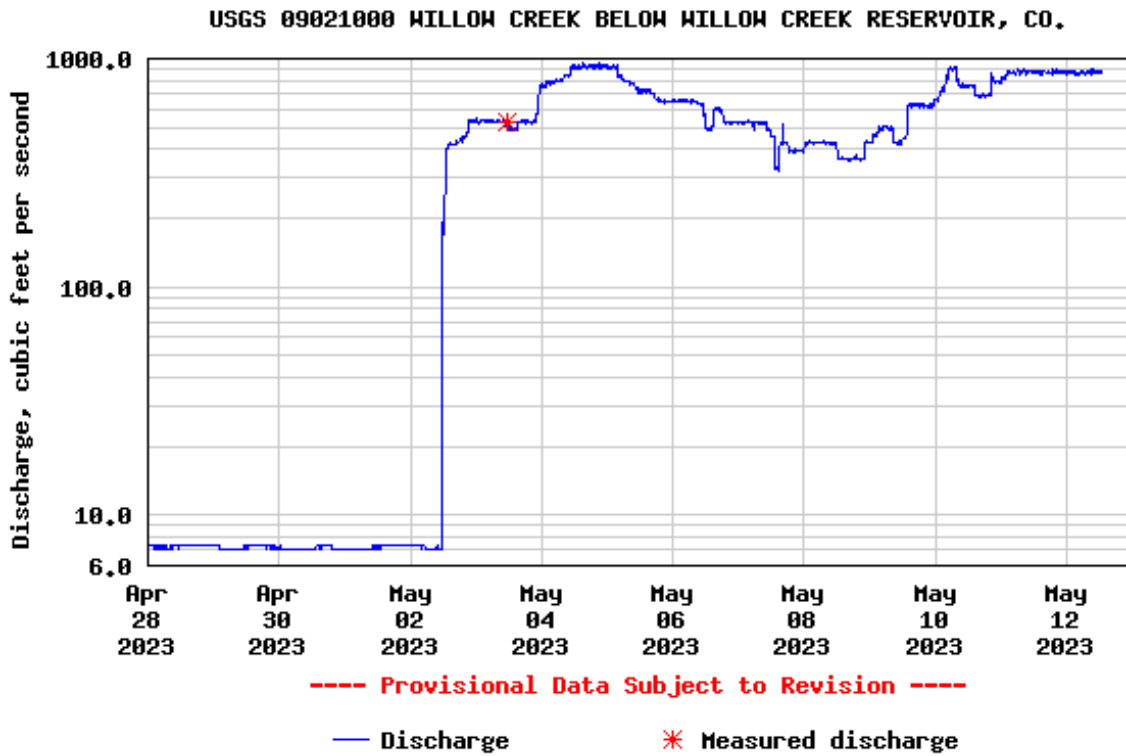


## Climate Prediction Center Seasonal Outlook



### Runoff Operations

The 2023 CBT AOP May 1 Most Probable Forecast model predicts that Granby Reservoir will fill, with a small spill predicted. Approximately 54 kaf is predicted to be pumped to Granby from Willow Creek, and a spill of about 27 kaf is predicted there. No pumping from Windy Gap is expected under this scenario. In 2020, approximately 46% of the C-BT project watershed burned in the East Troublesome Fire, including almost all of the Willow Creek drainage. Enhanced runoff due to post-fire conditions likely contributed to the early and ongoing spill at Willow Creek Reservoir, with a maximum of 900 cfs and a total of about 14 kaf bypassed to date, see graph below.



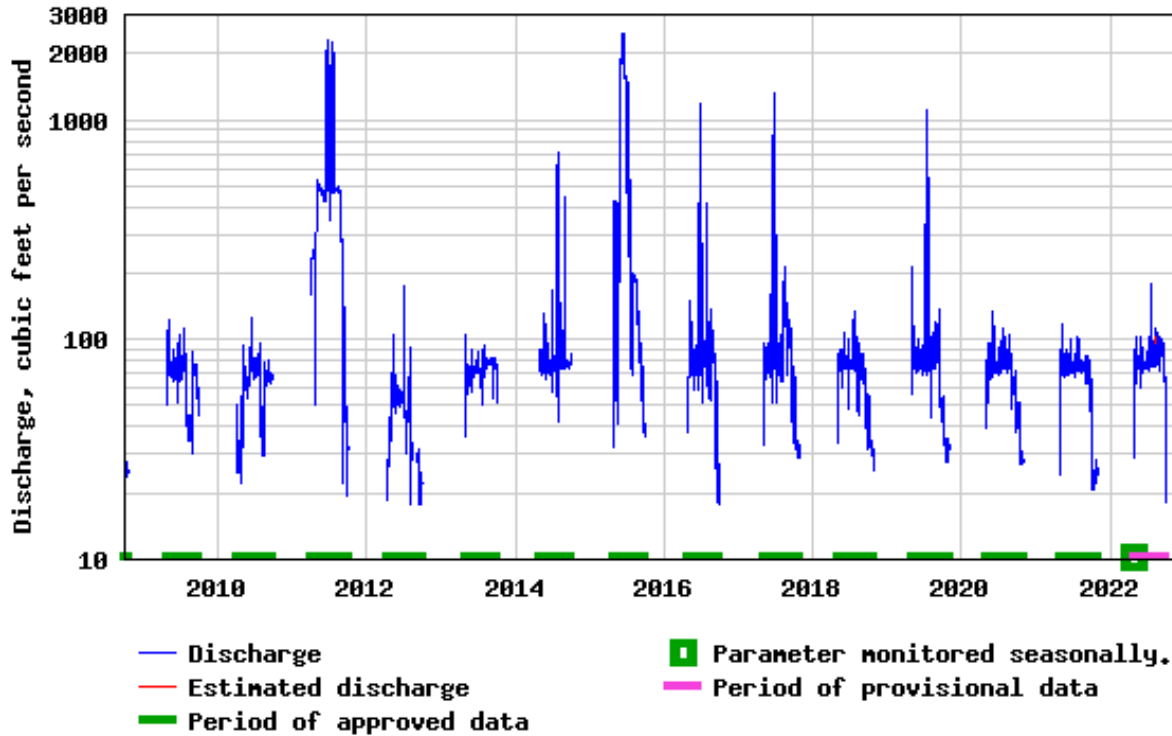
These bypasses have already helped address LBD concerns regarding necessary flows to flush accumulated sediment in the Colorado River above and below Windy Gap Reservoir, while satisfying the Municipal Subdistrict’s flushing flow requirement below Windy Gap Reservoir of 600 cfs for 50 hours at least every third year.

Although the Blue River basin is outside of the LBD CEA, runoff conditions there can impact in-season operations within the CEA. However, the CBT AOP May 1 Most Probable Forecast predicts that Green Mountain Reservoir will obtain an administrative and physical fill, meaning no water would be substituted by Denver Water and Colorado Springs from Williams Fork and Wolford reservoirs under this scenario.

CBT Project operations will be limited by Chimney Hollow connection work which will require an outage of Flatiron Unit 3, the only pump to Carter Lake, from 9/11/2023 to 12/11/2023.

Controlled spills have occurred at Granby Reservoir in 2011, 2014, 2015, 2016, 2017 and 2019, see graph below. These spills occur during wet periods when inflows exceed the storage capacity of Granby Reservoir.

USGS 09019500 COLORADO RIVER NEAR GRANBY, CO



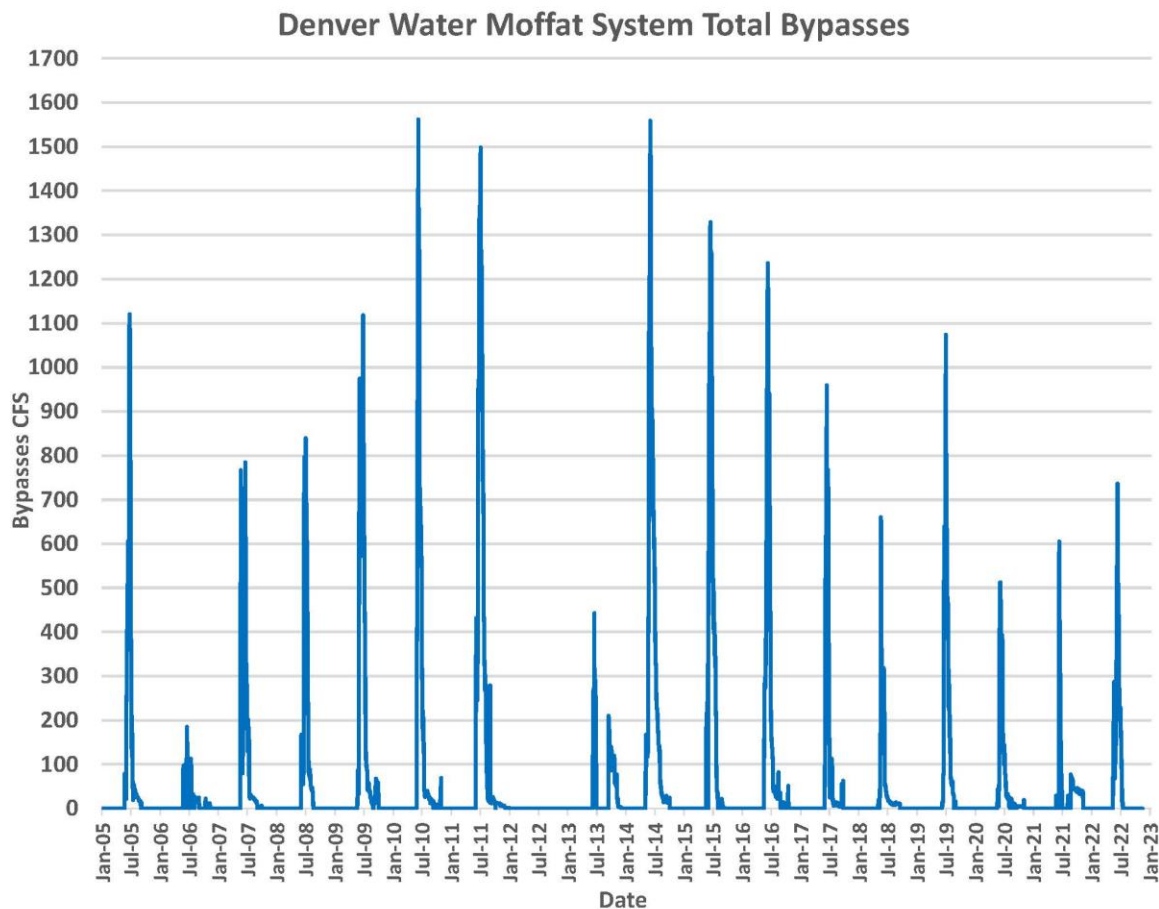
Moffat System undiverted flows have occurred in every year since 2005, except 2012 (see graph below). These undiverted flows (bypasses) include spills when Denver Water’s east slope facilities have filled, for maintenance activities on the Fraser River Collection System, and when voluntary bypasses occur. Denver Water will have limited flexibility for Moffat Tunnel operations (2022-2027) due to storage at Gross Reservoir being limited to around 60% of capacity due to construction activities for the Gross Reservoir Expansion Project. While this will increase bypass flows in the spring due to the reduced capacity of Gross Reservoir, flexibility for the remainder of the year will be severely limited. Fraser River diversions are expected to be limited to fill 10,000 to around 12,000 af of storage space in Gross and Ralston Reservoirs and to meet direct flow demands. Maximum diversions via the Moffat Tunnel are expected to be around 250 to 350 cfs. Diversions for the Upper Williams Fork system will be limited during runoff to help fill Williams Fork Reservoir, which has a 75% chance of filling.

Denver Water plans to maximize diversions on the South Ranch Creek portion of the Fraser River Collection System for diligence during runoff this year. This will entail bypassing everything on the Englewood System and bypassing everything else on the Ranch Creek side of Fraser Collection System except for South Ranch Creek and Buck Creek for a day when flows in the South Ranch Creek basin are peaking. This will likely occur in early to mid-June.

Since Cabin Creek has not met its flushing flow requirement (only 2 out of the last 5 years), and the Upper Williams Fork did not have a flushing flow in 2020, these two streams will be the first to receive bypass flows if available. All other streams have met flushing flow

targets in the last five years. The LBD subcommittee will work with Denver Water to identify other streams for additional bypass flows (flushing flows) during the spring.

Beginning in late April the LBD Operations Subcommittee began weekly meetings to track and discuss conditions as runoff operations progress. Discussions included LBD is hopeful that spills from the CBT system can be coordinated with bypasses at the Moffat System in mid-June to facilitate a flush of sediments accumulated just above and below Windy Gap Reservoir.



### In-Season Operations

In-Season flows below Granby Reservoir are generally dictated by minimum streamflow criteria per the 1961 Principles. However, late season flexibility is provided through the availability of 5,412.5 acre-feet in Granby Reservoir to the Endangered Fish Recovery Program in the 15-mile reach extending from the GVIC diversion structure to the confluence of the Gunnison River. If target flows in the 15-mile reach do not require additional water, this water can be released to provide benefits in Grand County on the Colorado River and the water exchanged into Williams Fork and / or Wolford Reservoir for later use by the Fish and Wildlife Service when additional water is needed for target flows in the 15-mile reach. The typical release schedule maintains 75 cfs at the USGS Granby gage in August and September when the 1961 Principles would have flows reduced to 40 and 20

cfs respectively in each of those months, but there is flexibility to alter the schedule based on local stream conditions and water needs for endangered fish.

This year, 50% of any unused MPWCD Windy Gap apportionment could be transferred to Grand County (the “Grand County Interim Transfer Water”) on August 1<sup>st</sup>. However, there is a chance that some or all of that water will spill, depending on how much water is spilled at Granby Reservoir and the amount of Windy Gap water stored at the time of spill.

The CRCA states that each year after the Moffat Project becomes operational, Denver Water will provide the Fraser 1,000 af of water for environmental purposes. Prior to the Moffat Project becoming operational per Denver Water’s 401 Certification, Denver Water will provide up to 1,000 af of voluntary releases in the Fraser Basin. Water temperatures will be monitored at locations throughout the Fraser River watershed to anticipate conditions detrimental to aquatic life. Denver Water will provide operational flexibility and voluntary water depending on runoff conditions and reservoir storage. If voluntary water is made available for bypass during 2023 In-Season operations, the Operations Subcommittee will work with Denver Water to identify an operational release schedule to reduce the likelihood of temperature exceedances on impacted reaches during late summer and early fall.

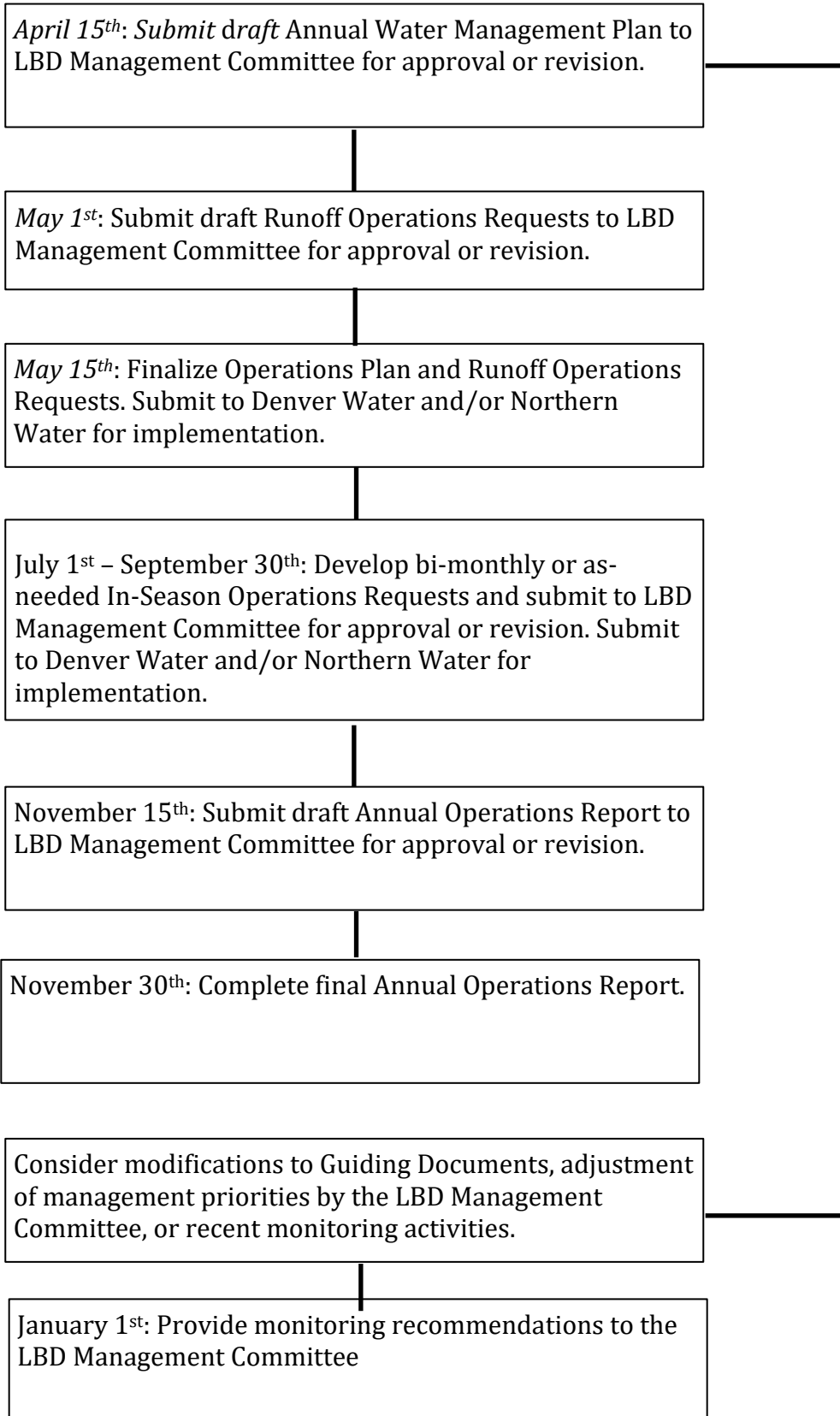
Denver Water is planning to have the Vasquez/St Louis side of the Moffat System (including the Upper Williams Fork Collection System) offline during the first 2 weeks of September 2023 to complete a bypass around the Vasquez Canal. This bypass will be operated during the summer and fall of 2024 so that Winter Park Recreation Association (WPRA) can move snowmaking pumps in the Vasquez canal.

Denver Water is planning to release water between July 15 and Aug 31 on Ranch Creek to meet its obligation to perform Voluntary Pilot Projects (VPPs) as described in Condition 3 of its 401 Certification. If Denver Water notifies LBD of additional availability of voluntary water in the Fraser Basin, LBD will provide recommendations on how to use flexibility regarding stream temperature water as soon as possible, in order to aid Denver Water in planning.

After the 2023 data collection is complete, the Operations Subcommittee will review streamflow and temperature data collected in the LBD Cooperative Effort Area (CEA) and will work with the Monitoring Subcommittee to determine appropriate data collection strategies for 2024.

## APPENDIX A

### LBD Operations Planning Schedule (*Recommended revisions to Guidelines in italics*)





## APPENDIX B

### LBD Water Sources and Quantities Offering Flexibility

#### 1. Moffat Collection System Voluntary/Enhancement Water

- 1,000 af environmental bypass made available from within the Moffat Collection System.
- Surplus water not needed by Denver Water in a given year.

#### 2. Northern/Subdistrict Water stored in Granby Reservoir

- Grand County's Water Supply
  - Variable Supply - 3.8% of Windy Gap Pumping in excess of 15,000 af, up to 1,500 af.
  - MPWCD transfer water – Potential for August 1 transfer equal to unused portion of Middle Park's Annual Water Supply, up to 2,300 af, from the prior Windy Gap accounting year (only half of the unused water is available for transfer prior to completion of Chimney Hollow Reservoir).
  - End of year pumping if the Subdistrict's pumping is complete. Grand County must pay power costs for pumping. Denver Water has allocated \$1 million to a pumping fund.
  - Storage Capacity:
    - Before Chimney Hollow completion – 7,500 af, if unused capacity in Granby Reservoir is available.
    - After Chimney Hollow completion - 4,500 af, if unused capacity in Granby Reservoir is available, with the ability to share MPWCD's storage if both Grand County and MPWCD agree.
- MPWCD's Water Supply
  - Variable Supply - 3.8% of Windy Gap Pumping in excess of 15,000 af, up to 1,500 af (potential average of 700 af).
  - Storage capacity of 3,000 af in Granby Reservoir, if unused capacity is available.

#### 3. Endangered Fish Water

- 5,412.5 af for endangered fish: The U.S. Fish and Wildlife Service (FWS) officially calls for this water, but Grand County can ask that the water be released from Granby after August 1<sup>st</sup> during wet years and exchanged into Williams Fork and/or Wolford Reservoir, until FWS asks for the release to the 15-mile reach. Releases depend on the type of hydrologic year and the targeted streamflow in the Colorado River in the 15-mile reach. These releases are coordinated with Grand County and

other interested parties during the Historic User Pool (HUP) calls and benefit the Colorado River below Granby Reservoir. The typical release schedule aids in maintaining a 75 cfs flow at USGS Granby gage from August 1 through mid-September.

#### 4. Williams Fork Reservoir Storage

- 1,000 af environmental water (CRCA) stored when 1,000 af environmental water is bypassed during a mainstem Colorado River Call. 2,500 af maximum carryover, first to spill, notification of anticipated spill. [See Section III.E.10-11 of CRCA]